

PATENT ABSTRACTS OF JAPAN

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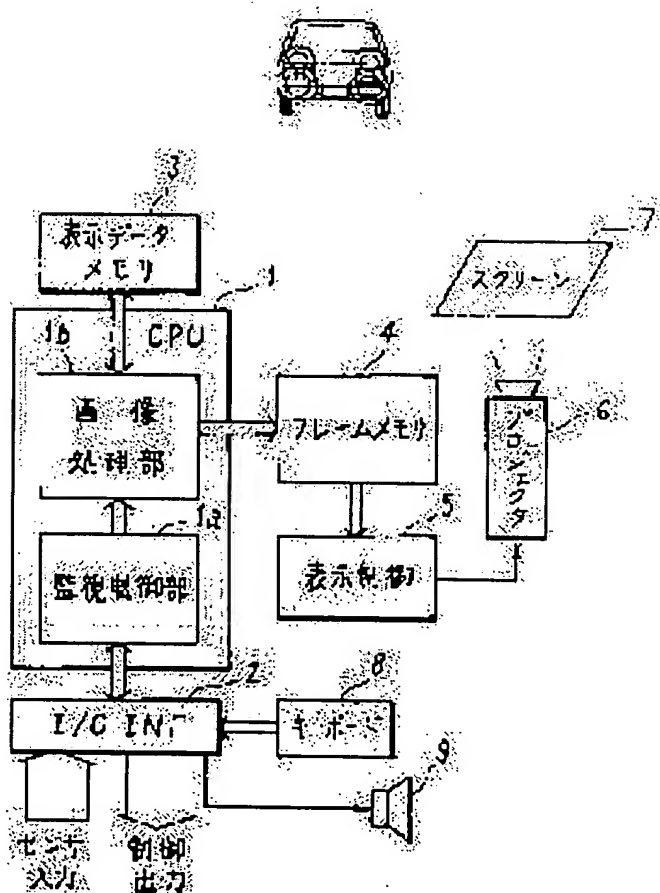
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(54) DISPLAY DEVICE FOR VEHICLE

(57)Abstract:

PURPOSE: To prevent both a missing of data included in the scene, and an oversight of a display data, by composing the display data by only the outlines.

CONSTITUTION: In a display device for vehicle, the display data is composed of only the outlines, and its semitransparent screen 7 can be seen in the condition superposing the display data and the scene in front of the vehicle. And in a display data memory 3, various display data such as characters, marks, and drawings displayed in a headup type display device processed by a CPU 1, are stored. And the CPU 1 displays the car speed in the headup type display device, for example, when the car speed exceeds a specific value, as an alarm to the driver concurrently. For example, since the figure part '88' is composed of only the outlines, a missing of the data important for the full driving at the rear side of a preceding vehicle immediately at the front side can be avoided.



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CLAIMS

[Claim(s)]

[Claim 1] It is the indicating equipment for cars characterized by said indicative data consisting of only border lines in the turning-the-head-up mold indicating equipment which displays as an indicative data that it piles up with the scene which the operator of a car looks at, and at least one of an alphabetic character, a notation, and graphic forms is put together.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the display for cars of a turning-the-head-up mold especially about the display for cars used for the operation exchange equipment of a car etc.

[0002]

[Description of the Prior Art] Various kinds of operation exchange equipments for supporting a safety operation and comfortable operation of a car recently are developed variously. The display for cars of the turning-the-head-up mold which enabled it to get to know required information about operation is known by laying information, such as a travel speed required for a safety operation of a car, on top of the space ahead of a car with the scene which a fate person looks at, and displaying it on it as most fundamental thing of this kind of operation exchange equipment, without an operator neglecting a front gaze. This turning-the-head-up type of display for cars is constituted by making a windshield reflect indicative datas, such as an alphabetic character, a notation, and a graphic form, and putting into an operator's field of view so that an operator can pile up and see an indicative data in the scene ahead of the car under gaze through a windshield, as indicated by JP,63-243816,A.

[0003] Instead of reflecting an indicative data by the windshield, a translucent screen is installed between a windshield and an operator's face, and a configuration which carries out incidence of the indicative data reflected on this screen to an operator's eyes as if it was the beam of light emitted from the image with which ** was also put ahead [car] is also known as indicated by JP,64-83424,A.

[0004]

[Problem(s) to be Solved by the Invention] It consists of indicating equipments of the above-mentioned conventional turning-the-head-up mold so that an operator may pile up indicative datas, such as an alphabetic character and a notation, with the scene ahead of a car and may look at them. Consequently, a part of scene of the front under gaze will be covered by the indicative data, and there is a possibility that information important for a safety operation may be missing.

[0005] For example, 88km / h which shows the travel speed of this car to the central part within the scene ahead of the car which an operator looks at through a windshield as shown in drawing 4 (A) The data to say should be displayed with the display for cars of a turning-the-head-up mold. If a partial enlarged drawing (B) is referred to, in this example, the last hind brake lamp and last hind blinker of a precedence car will be covered by the figure "88" turning-the-head-up on display, and there is a problem

of misjudging information important for the safety operation in which it is contained in scene so that still more clearly. In addition, in drawing 4 , the black part is equivalent to the part of high brightness.

[0006] If an indicative data is made small or it is made thin, the area within the scene covered by the indicative data can be reduced, and lack of information important for the safety operation included that much in scene can be avoided. However, the new problem of inducing an oversight of an indicative data required for a safety operation in connection with this arises. Therefore, the purpose of this invention is to offer the display for cars of the turning-the-head-up mold which can avoid the both sides of informational lack and an oversight of an indicative data included in scene.

[0007]

[Means for Solving the Problem] As for the indicating equipment for cars of the turning-the-head-up mold of this invention, the indicative data consists of only border lines.

[0008]

[Function] Since it decreases sharply compared with the case where the area within the scene covered by such indicative data is the former since the indicative data consists of only border lines, the opportunity of lack of the information in required scene [*****] is reduced. Moreover, since an indicative data is displayed not with a mere thin center line but with a border line with a certain width of face, the opportunity of an oversight of an indicative data also decreases. Hereafter, this invention is further explained to a detail with an example.

[0009]

[Example] the block diagram showing the configuration of the operation exchange equipment with which drawing 3 contains the indicating equipment for cars of the turning-the-head-up mold of one example of this invention -- it is -- 1 -- for display data memory and 4, as for a display-control circuit, a screen with 6 [translucent / a projector and 7], and 8, a frame memory and 5 are [CPU and 2 / an input/output interface circuit and 3 / a keyboard and 9] loudspeakers. The translucent screen 7 is constituted so that it can see, where the indicative data in which it is arranged between the driver's seat and the windshield conventionally like the case of equipment, it was projected on the operator on the screen 7, and was reflected there and the scene ahead of a car which were indicated by JP,64-83424,A mentioned above are superimposed.

[0010] Various kinds of indicative datas, such as an alphabetic character displayed on the indicating equipment of a turning-the-head-up mold by processing of CPU1, a notation, and a graphic form, are stored in the display data memory 3. These indicative datas consist of only border lines. That is, if a border line is extracted from alphabetic characters, such as an arabic numeral of a proper size as shown in the lower berth of drawing 2 , and notations, such as an arrow head, the alphabetic character and notation which consist only of a border line as shown in an upper case will be obtained. Various kinds of indicative datas only based on such a border line are created beforehand, and are registered into the predetermined address of the display data memory 3.

[0011] Supervisory-control section 1a in CPU1 processes each of this received sensor signal, and outputs it to various kinds of actuators of the correspondence which does not illustrate each control signal which created and created various kinds of control signals through the input/output interface section 2 while receiving it from various kinds of sensors which do not illustrate various kinds of sensor signals showing the run state of cars, such as the vehicle speed, acceleration, and a rudder angle, through the input/output interface section 2. As an example of data display processing, if the vehicle speed exceeds a predetermined value, CPU1 will serve also as warning to an operator, and will display this

vehicle speed on the display of a turning-the-head-up mold.

[0012] Drawing 1 made the conventional turning-the-head-up mold indicating equipment shown in drawing 4 correspond, and has illustrated the indicative data based on this example. That is, the figure part "88" with a vehicle speed of 88km [h] is displayed in the condition of having laid on top of the precedence car in front of in the scene ahead of the car which an operator looks at through a windshield. Since this figure part "88" consists of only border lines, if the last hind brake lamp and last hind blinker of a precedence car are hidden by this, it does not break, but lack of information important for all operations is avoided. In addition, the high brightness part is displayed black like drawing 4 which mentioned above also in this Fig.

[0013]

[Effect of the Invention] As explained to the detail above, the area in the scene in which the indicating equipment for cars of the turning-the-head-up mold of this invention is covered by the indicative data since indicative datas, such as an alphabetic character, a notation, and a graphic form, consist of only border lines is reduced, and the opportunity of informational lack is reduced that much. Moreover, since an indicative data is displayed with a border line with mere not a thin center line but a certain width of face, the opportunity of an oversight of an indicative data is also reduced.

[Translation done.]

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TECHNICAL FIELD

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PRIOR ART

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EFFECT OF THE INVENTION

[Effect of the Invention] As explained to the detail above, the area in the scene in which the indicating equipment for cars of the turning-the-head-up mold of this invention is covered by the indicative data since indicative datas, such as an alphabetic character, a notation, and a graphic form, consist of only border lines is reduced, and the opportunity of informational lack is reduced that much. Moreover, since an indicative data is displayed with a border line with mere not a thin center line but a certain width of face, the opportunity of an oversight of an indicative data is also reduced.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] It consists of indicating equipments of the above-mentioned conventional turning-the-head-up mold so that an operator may pile up indicative datas, such as an alphabetic character and a notation, with the scene ahead of a car and may look at them. Consequently, a part of scene of the front under gaze will be covered by the indicative data, and there is a possibility that information important for a safety operation may be missing.

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MEANS

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OPERATION

[Function] Since it decreases sharply compared with the case where the area within the scene covered by such indicative data is the former since the indicative data consists of only border lines, the opportunity of lack of the information in required scene [*****] is reduced. Moreover, since an indicative data is displayed not with a mere thin center line but with a border line with a certain width of face, the opportunity of an oversight of an indicative data also decreases. Hereafter, this invention is further explained to a detail with an example.

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EXAMPLE

[Example] the block diagram showing the configuration of the operation exchange equipment with which drawing 3 contains the indicating equipment for cars of the turning-the-head-up mold of one example of this invention -- it is -- 1 -- for display data memory and 4, as for a display-control circuit, a screen with 6 [translucent / a projector and 7], and 8, a frame memory and 5 are [CPU and 2 / an input/output interface circuit and 3 / a keyboard and 9] loudspeakers. The translucent screen 7 is constituted so that it can see, where the indicative data in which it is arranged between the driver's seat and the windshield conventionally like the case of equipment, it was projected on the operator on the screen 7, and was reflected there and the scene ahead of a car which were indicated by JP,64-83424,A mentioned above are superimposed.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the conceptual diagram showing the situation of the alphabetic data displayed with the indicating equipment of the turning-the-head-up mold of one example of this invention, and a part of overlaps of scene.

[Drawing 2] It is the conceptual diagram illustrated while contrasting with the conventional indicative data (lower berth) the indicative data (upper case) which consists only of a border line which indicates by turning the head up in the above-mentioned example.

[Drawing 3] It is the block diagram showing the configuration of the indicating equipment for cars of the turning-the-head-up mold by the above-mentioned example.

[Drawing 4] It is the conceptual diagram showing the situation of the alphabetic data displayed with the indicating equipment of the conventional turning-the-head-up mold, and a part of overlaps of scene.

[Description of Notations]

- 1 CPU
- 2 Input/output Interface Circuit
- 3 Display Data Memory
- 4 Frame Memory
- 5 Display-Control Circuit
- 6 Projector
- 7 Screen

[Translation done.]

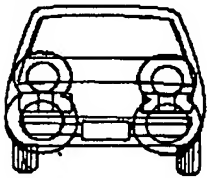
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DRAWINGS

[Drawing 1]

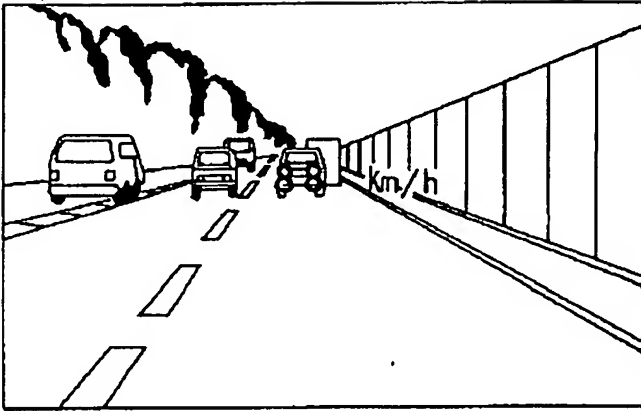


[Drawing 2]

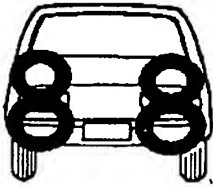


[Drawing 4]

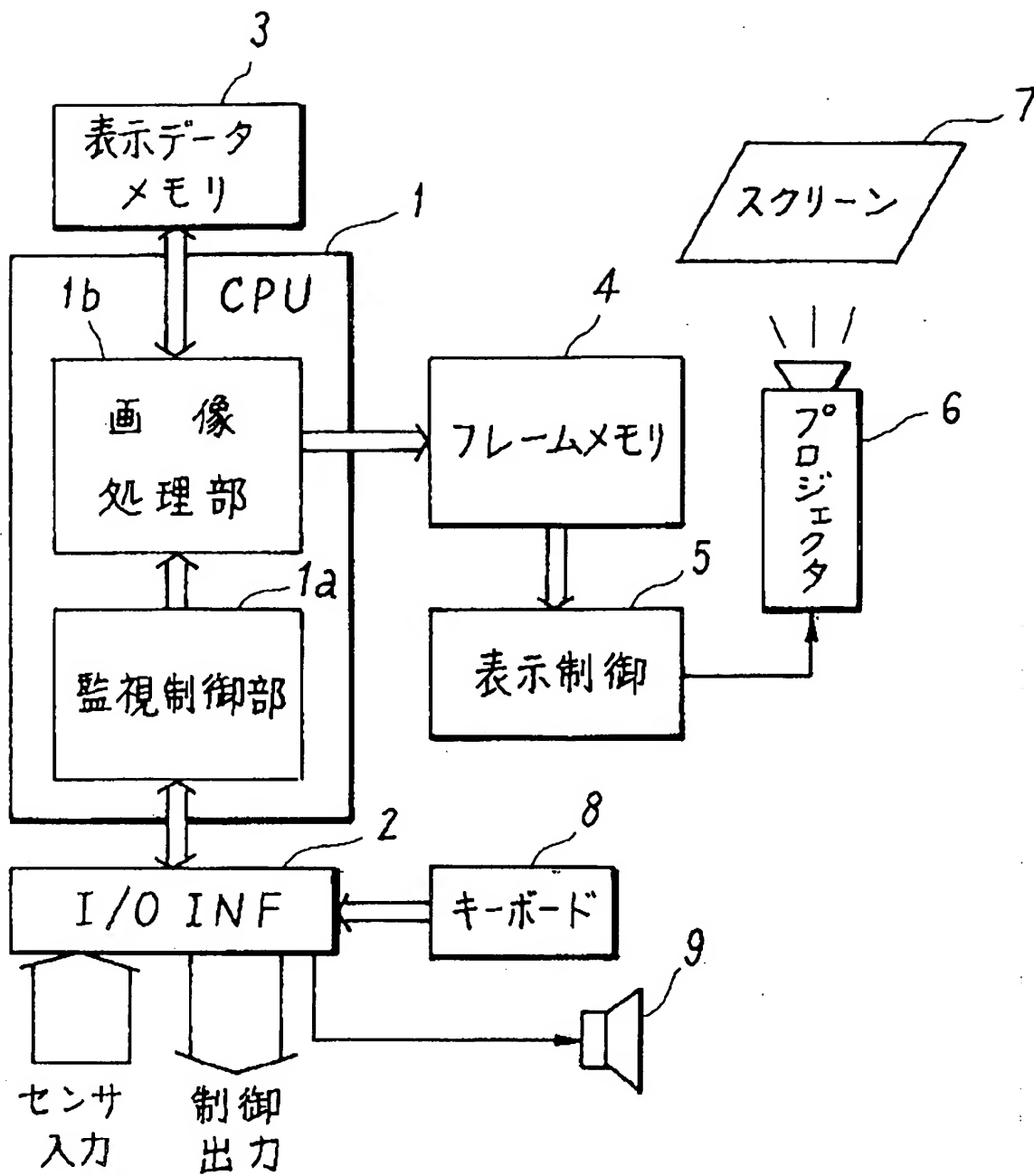
(A)



(B)



[Drawing 3]



[Translation done.]